

Claims

1. An electric motor for powering downhole tools comprising:
 - 5 a first stator;
 - a second stator;
 - conductive windings
 - 10 an axially located rotatable shaft including a first magnetic element and a second magnetic element
 - a sealed annular chamber defined by a first tube, and a second tube
 - 15 concentrically inside the first tube,

the first and second stators being located in the annular chamber, the first magnetic element being aligned with the first stator and the second magnetic element being aligned with the second stator such that when the

 - 20 windings are energised the stators act on the magnetic elements.
2. An electric motor according to claim 1, wherein the conductive windings comprise a first set of coil windings disposed in the first stator and a second set of coil windings disposed in the second stator.
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3. An electric motor according to either claim 1 or 2, wherein there are provided more than two stators located in the annular cavity, and a corresponding number of magnetic elements.

4. An electric motor according to any previous claim, wherein the second tube is disposed in the outer tube and secured by swaging.
- 5 5. An electric motor according to any previous claim, wherein the rotatable shaft comprises separately formed shaft elements which are secured together in series.
6. An electric motor according to claim 5, wherein a first shaft element
10 is disposed within the first stator, and a second shaft element is disposed within the second stator.
7. An electric motor according to any previous claim, wherein the outer tube comprises separately formed outer tube elements which are secured
15 together in series.
8. An electric motor according to any previous claim, wherein the outer tube is at least partially secured to the modules by inward radial deformation.
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9. An electric motor according to any previous claim, wherein the second tube is made from a non-magnetisable material.
10. An electric motor according to any previous claim, wherein the
25 chamber includes a pressure compensation means.
11. An electric motor according to claim 10, wherein the pressure compensation means is provided by the annular seals being axially slidable.

12. An electric motor according to any previous claim, wherein the connection of the windings to the power supply is enclosed in the sealed chamber.
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13. An electric motor according to any previous claim, wherein the rotor is connected to a pump.
14. An electric motor according to any previous claim, wherein inner
10 tube forms an internal bore for the passage of well fluids.
15. An electric motor suitable for installing in a borehole for powering downhole tools comprising
- 15 a stator including a first set of coil windings
- a rotatable shaft including a magnetic element
- an annular cavity defined by a first hollow tube, and a second tube
20 concentrically inside the first tube, the second tube including a flowpath,
- the stators being located in the annular cavity, the rotatable shaft and the magnetic element being at least partially tubular.
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- 16 An electric motor according to claim 15, wherein the rotatable shaft is located radially outside the stator with the magnetic element the being

aligned with the stator such that the stator when energised can act upon the magnetic element.

17. An electric motor according to either claim 15 or 16, wherein there
5 are provided more than two stators located in the annular cavity, and a corresponding number of magnetic elements.

18. An electric motor according to any of claims 15 to 17, wherein the second tube is disposed in the outer tube and secured by swaging.

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19. An electric motor according to any of claims 15 to 18, wherein the rotatable shaft comprises separately formed shaft elements which are secured together in series.

15 20. An electric motor according to any of claims 15 to 19, wherein the second tube is made from a non-magnetisable material.

21. An electric motor according to any of claims 15 to 20, wherein the chamber includes a pressure compensation means.

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22. An electric motor according to claim 21, wherein the pressure compensation means is provided by the annular seals being axially slidable.

23. An electric motor according to any of claims 15 to 22, wherein the
25 connection of the windings to a DC supply is enclosed in the sealed chamber.

24. An electric motor according to any of claims 15 to 23, wherein the rotor is connected to a pump.